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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,660	09/23/1999	MASAAKI NAKABAYASHI	684.2902	4966

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No.	Applicant(s)	
	09/401,660	NAKABAYASHI ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover she t with the correspondence addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2004 and 16 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/4/03, 11/12/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendments filed on February 12, 2004 and March 16, 2004, which have been entered into the file.
- By these amendments, the applicant has amended claims 21 and 24 and has canceled claims 1-20.
- Claims 21-28 remain pending in this application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harris (PN. 5,496,616) in view of the patent issued to Hashimoto et al (PN. 4,247,190) and Okai et al (PN. 5,340,637).

Harris ('616) teaches a *diffractive optical element* that is comprised of a *diffraction grating portion* having a *first binary diffractive optical element* (10, Figure 1) with grating structure formed on a *first substrate* (14) and a *second corrector binary diffractive optical element* (24) with grating structure formed on a *second substrate* (28). Harris ('616) teaches that the first and second binary diffractive optical elements are accumulated with an *air space therebetween*, (please see Figure 1 and column 5).

Harris ('616) further teaches that *alignment markings* could be produced at predetermined location on both of the substrates to align the two binary diffractive elements, (please see column 8, lines 16-20). However this reference does not teach *explicitly* that the alignment markings on the two substrates are ***engaged*** to each other to assure the alignment. **Hashimoto et al** in the same field of

endeavor teaches *explicitly* to have pins (c, Figure 1(A) and 1(B)) and holes (c') formed on two optical structures (A and B), to serve as the *alignment markings*, such that the pins are *engaged* with the holes to ensure and to achieve the correct alignment of the two optical structures, (please see column 5, lines 4-25). It would then have been obvious to one skilled in the art to apply the teachings of Hashimoto et al to explicitly use the engaging pins and holes as the alignment markings to achieve the correct alignment of the diffractive grating portions of Harris for the benefit of providing the alignment markings with simple design and easy engagement. With regard to claim 24, these references do not teach *explicitly* that the alignment markings are transparent. However the transparency does not change the function of the alignment markings and therefore such modification is considered to be obvious matters of design choice to one skilled in the for the benefit of providing the markings as desired.

Claims 21 and 24 have been amended to include the features that the diffraction grating and the alignment marking are integrally formed of a resin on a glass substrate. Harris teaches explicitly that the diffractive optical elements (10 and 24) are formed by molding process by using a mold to press diffractive structure on a soft material such as plastic or polymer and the hard substrate (14 and 28) is made of glass, (please see column 9, lines 39-54). Although this reference does not teach explicitly that the soft molding materials include resin, however resin is a known type of plastic material that is commonly used in the art to make optical material. **Okai** et al in the same field of endeavor teaches explicitly to use a molding process (Figure 15(a)) to press diffractive optical structure on a resin (155) wherein the resin is on a glass substrate (154). It would then have been obvious to one skilled in the art to apply the teachings of Okai et al to use a resin material to make the diffractive gratings in the molding process for the benefit of making the diffractive optical element with ready to use and low cost materials. Furthermore, it has been held it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Although Harris ('616) teaches explicitly that the alignment marks are made by

photolithographic process, but this reference also teaches that **other conventional means** may be used to make the alignment markings, (please see column 8, lines 19-20). It would therefore have been obvious modification to one skilled in the art to make the alignment markings also with the molding process since both lithographic process and molding process are conventional process for making grooves, marks or grating on a substrate and it would be more economical to make both the diffractive optical element and the alignment markings in the same molding process. Furthermore, it would also have been an obvious modification to one skilled in the art to make the alignment markings fitted to each other during the molding process for the benefit of achieving good alignment during the molding process.

With regard to claims 23 and 26, the two diffraction gratings are disposed opposing to each other, (please see Figure 4).

With regard to claims 27 and 28, the diffractive binary optical elements taught by Harris ('616) are optical elements that applicable in optical system. To sue it with a lens would have been obvious modification to one skilled in the art to achieve the desired optical function in the optical system.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. **Claims 21-28 are rejected** under the judicially created doctrine of **obviousness-type double patenting** as being unpatentable over claims 1-3, 7, 9, 12, 20 and 22-28 of **U.S. Patent No. 6,731,431** in

view of U.S. Patent issued to Okai et al (PN. 5,340,637). Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings. Claims 21 and 24 of the instant application **have been amended** to include the feature that the diffractive gratings are formed of resin on a glass substrate. **Okai** et al in the same field of endeavor teaches that it is common to form diffraction grating with resin on a glass substrate, (please see Figure 15(a)). This difference therefore does not patently distinct the instant application from the cited US patent (PN. 6,731,431).

5. **Claims 21-28 are rejected** under the judicially created doctrine of **obviousness-type double patenting** as being unpatentable over claims 1, 3, 6-8 and 10-11 **of U.S. Patent No. 6,523,963**. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings.

Response to Arguments

6. Applicant's arguments with respect to claims 21-28 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments are mainly drawn to the newly amended features in the claims and they have been fully considered and addressed in the paragraphs above.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.